

What is claimed is:

- Sub Cl*
1. A system for performing one or more relevant measurements at a target site in an animal body, the system comprising:
    - a probe that can be inserted into a body adjacent to or within a target site and that comprises at least one of:
      - a first probe mechanism that measures one or more elastic parameters associated with the target site drawn from a group consisting of a Young's modulus, a bulk modulus and a Poisson's ratio associated with the target site;
      - a second probe mechanism that measures one or more thermal parameters, drawn from a group consisting of local temperature, thermal conductivity and specific heat capacity associated with the target site;
      - a third probe mechanism that measures optical reflectance OR( $\lambda$ ,meas) of a selected region of the target site for one or more selected wavelength ranges;
      - a fourth probe mechanism that measures a selected characteristic of a margin of the target site;
      - a fifth probe mechanism that measures amount of blood flow adjacent to or within the target site;
      - a sixth probe mechanism that measures interstitial fluid pressure adjacent to or within the target site;
      - a seventh probe mechanism that measures vascular size and/or vascular density associated with the target site;
      - an eighth probe mechanism that measures oxygen tension pO<sub>2</sub> associated with the target site;
      - a ninth probe mechanism that measures local pH associated with a selected portion of the target site; and
      - a tenth probe mechanism that measures at least one electrical parameter associated with a selected portion of the target site; and

a database and analyzer that receives and compares each measurement made by the probe with a corresponding range of values that is representative of a normal target site and, for each probe measurement that does not fall within the corresponding range of values for a normal target site, the database and analyzer provides at least one medical condition of the target site that is generally consistent with the probe measurement.

2. The system of claim 1, wherein said at least one probe measurement is combined with at least one additional measurement that is drawn from a group of measurements, performed adjacent to or within said target site, consisting of lymph node samples, mammograms, ultrasound scans, NMRI scans, CAT scans, estimation of target site size, estimation of target site shape, estimation of target site surface roughness and estimation of calcification.

3. The system of claim 1, wherein at least one probe measurement is combined with at least one additional information item that is drawn from a group consisting of (1) at least one medical condition that said animal has exhibited and (2) at least one medical condition that a family member of said animal has exhibited.

4. The system of claim 1, wherein, when each of at least two of said probe mechanisms provides a measurement value that does not fall within said corresponding range of values for said normal target site, said database and analyzer provides at least one disease or malady of said target site that is consistent with each of the at least two probe mechanism measurements.

5. The system of claim 1, wherein said analyzer comprises a neural net device that receives and processes said measurement from said at least one probe mechanism and provides a processed measurement value that can be compared with said corresponding range of values for said normal target site.

6. The system of claim 5, wherein said neural net device performs a radial basis neural network analysis.

7. The system of claim 5, wherein said neural net device performs a backpropagation neural network analysis.

*Subj* 8. The system of claim 1, wherein at least one of said probe mechanisms is used to navigate said probe to a location adjacent to or within said target site.

9. A method for performing one or more relevant measurements at a target site in an animal body, the method comprising:

providing a probe that can be inserted into a body adjacent to or within a target site and that comprises at least one of:

a first probe mechanism that measures one or more elastic parameters associated with the target site drawn from a group consisting of a Young's modulus, a bulk modulus and a Poisson's ratio associated with the target site;

a second probe mechanism that measures one or more thermal parameters, drawn from a group consisting of local temperature, thermal conductivity and specific heat capacity associated with the target site;

a third probe mechanism that measures optical reflectance  $OR(\lambda; meas)$  of a selected region of the target site for one or more selected wavelength ranges;

a fourth probe mechanism that measures a selected characteristic of a margin of the target site;

a fifth probe mechanism that measures amount of blood flow adjacent to or within the target site;

a sixth probe mechanism that measures interstitial fluid pressure adjacent to or within the target site;

a seventh probe mechanism that measures vascular size and/or vascular density associated with the target site;

an eighth probe mechanism that measures oxygen tension pO<sub>2</sub> associated with the target site;

a ninth probe mechanism that measures local pH associated with a selected portion of the target site; and

a tenth probe mechanism that measures at least one electrical parameter associated with a selected portion of the target site; and

providing a database and analyzer, including a computer that is programmed to receive and compare each measurement made by the probe with a corresponding range of values that is representative of a normal target site and, for each probe measurement that does not fall within the corresponding range of values for a normal target site, the database and analyzer provides at least one disease or malady of the target site that is consistent with the probe measurement.

10. The method of claim 9, further comprising combining said at least one of said probe measurements with at least one additional measurement, performed adjacent to or within said target site, consisting of lymph node samples, mammograms, ultrasound scans, NMRI scans, CAT scans, estimation of target site size, estimation of target site shape, estimation of target site surface roughness and estimation of calcification.

11. The method of claim 9, further comprising combining at least one of said probe measurements with at least one additional information item that is drawn from a group consisting of (1) at least one medical condition that said animal has exhibited and (2) at least one medical condition that a family member of said animal has exhibited.

12. The method of claim 9, further comprising:  
when each of at least two of said probe mechanisms provides a measurement value that does not fall within said corresponding range of values for said normal target site, said computer is programmed to provide at least one disease or malady of said target site that is consistent with each of the at least two probe mechanism measurements.
13. The method of claim 9, further comprising providing said analyzer with a neural net device that receives and processes said measurement from said at least one probe mechanism and provides a processed measurement value that can be compared with said corresponding range of values for said normal target site.
14. The method of claim 13, further comprising choosing said neural net device to perform a radial basis neural network analysis.
15. The method of claim 13, further comprising choosing said neural net device to perform a backpropagation neural network analysis.
- Sub A3* 16. The method of claim 9, further comprising using at least one of said probe mechanisms to navigate said probe to a location adjacent to or within said target site.

*Add A4*      *Add B4*